

CLAIMS

What is claimed is:

1 1. A low noise amplifier redundancy system comprising:
2 an antenna receiving a received signal;
3 at least two low noise amplifiers (LNAs), each low noise amplifier comprising
4 a low noise amplifier input that receives the received signal and a low noise amplifier
5 output;
6 an switch having an input connected to the received signal, and at least two
7 outputs, each output connected to a separate low noise amplifier input;
8 a controller that controls the switch and the low noise amplifiers to select one
9 of the low noise amplifiers, such that the received signal is amplified by only one of
10 the low noise amplifiers; and
11 a combiner connecting the outputs of the low noise amplifiers to a single
12 signal line.

1 2. A redundant receiving system comprising:
2 a plurality of receiving chains, each comprising
3 a received signal;
4 a splitter having two outputs with each outputting the same received
5 input signal;
6 a down converter connected to one output of the splitter; and
7 an upstream receiver connected to the down converter;
8 a redundancy switch having a plurality of inputs, each input connected to a
9 splitter output from each receiving chain;
10 a back-up down converter connected to an output of the redundancy switch;
11 a back-up upstream receiver connected to the back-up down converter; and

a first controller connected to the redundancy switch to select one of the outputs from the plurality of splitters.

3. The system of Claim 2, wherein each receiving chain further comprises:
an amplifier switch having an input connected to the received signal, and two outputs;
two low noise amplifiers (LNAs), each low noise amplifier having an input connected to one output of the amplifier switch;
a second controller connected to control the amplifier switch and the low noise amplifiers, such that the received signal is amplified by only one of the low noise amplifiers; and
a combiner connecting the outputs of the low noise amplifiers to the splitter.

4. The system of Claim 3, wherein each receiving chain further comprises a band-pass filter connected between the antenna and the switch.

5. A method for providing redundancy in a wireless hub, comprising:
receiving a plurality of upstream signals;
amplifying each upstream signal with a separate low noise amplifier;
down converting the output of each of the low noise amplifier by utilizing a separate down converter;
receiving a down converted signal from each down converter with a separate receiver;
providing a data signal from a receiver; and
when no data signal is provided by one of the receivers, selecting an alternate low noise amplifier to amplify the associated upstream signal.

6. The method of Claim 5, further comprising when no data signal is provided by one of the receivers after selecting an alternate low noise amplifier, providing the

3 output of the low noise amplifier associated with the receiver to a redundant down
4 converter, the redundant down converter providing a redundant down converted signal
5 to a redundant receiver.

1 7. A method for providing redundancy in a wireless hub, comprising:
2 receiving a plurality of upstream signals;
3 amplifying each upstream signal with a separate low noise amplifier;
4 down converting the output of each of the low noise amplifier by utilizing a
5 separate down converter;
6 receiving a down converted signal from each down converter with a separate
7 receiver;
8 providing a data signal from a receiver; and
9 when no data signal is provided by one of the receivers, providing the output
10 of the low noise amplifier associated with the receiver to a redundant down converter,
11 the redundant down converter providing a redundant down converted signal to a
12 redundant receiver.

1 8. A low penetration receiving system comprising:
2 a plurality of low noise amplifiers;
3 a switch having a plurality of inputs, each input connected to one low noise
4 amplifier;
5 a down converter connected to an output of the switch; and
6 an upstream receiver connected to the down converter;
7 wherein the down converter and receiver are time shared between signals
8 produced by each low noise amplifier.

1 9. A low penetration receiving system with redundancy comprising:

2 a plurality of low noise amplifiers, each amplifier amplifying an
3 upstream signal;
4 a plurality of splitters, each splitter connected to an amplifier and
5 having a first output and a second output;
6 a first switch having a plurality of inputs, each input connected to a
7 distinct one of the first outputs of the plurality of splitters;
8 a second switch having a plurality of inputs, each input connected to a
9 distinct one of the second outputs of the plurality of splitters;
10 a first down converter connected to an output of the first switch;
11 a first upstream receiver connected to the first down converter;
12 a second down converter connected to an output of the second switch;
13 and
14 a second receiver connected to the second downconverter.

1 10. The system of Claim 9, further comprising a plurality of secondary low
2 noise amplifiers, wherein one secondary low noise amplifier is connected in parallel to
3 one of the plurality of low noise amplifiers.

1 11. A method for low penetration redundancy, the method comprising:
2 receiving a plurality of upstream signals;
3 amplifying each upstream signal with a separate low noise amplifier;
4 splitting each amplified signal into two signals;
5 down converting the output of each of the low noise amplifier with a single
6 down converter;
7 receiving a down converted signal from the down converter with a single
8 receiver;
9 time sharing the down converter and receiver during a low penetration period;

10 providing a data signal from the receiver; and
11 when no data signal is provided by the receiver when receiving a signal from
12 one of the low noise amplifiers, providing the output of the low noise amplifier to a
13 redundant down converter, the redundant down converter providing a redundant down
14 converted signal to a redundant receiver.